

## NOTE

(1) A feature of the present invention consists in the fact that an upper magnetic core and a lower magnetic core are divided and formed in two segments and a frame plating is carried out with either negative resist or an electron beam exposure resist in order to set a distance between the extremity end of the divided and formed lower stage magnetic core and the extremity end of the upper stage magnetic core to be 0.2 to 1.5  $\mu\text{m}$ .

(2) Referring to Sketch 1 indicated in a sheet attached, it is apparent that when a distance between the extremity end of the lower stage magnetic core and the extremity end of the upper stage magnetic core is 1.5  $\mu\text{m}$  or more, a recording magnetic field intensity at a floating plane rapidly decreases.

(3) Although it is preferable that a distance between the extremity end of the lower stage magnetic core and the extremity end of the upper stage magnetic core is 0 in view of a recording magnetic field intensity, if the distance is 0, the recording magnetic field is not concentrated at a magnetic gap.

Because, a magnetic field intensity distribution figure with  $Y = 0 \mu\text{m}$  of Sketch 2A shows that an area where contour lines are closely near to each other is formed at

an upper segment in this Sketch. It means that some magnetic fluxes are concentrated at this portion. Thus, if there is present a portion where some magnetic fluxes are concentrated in this way, there occurs a possibility that the magnetic field leaks out of this portion and a recording is performed on a medium at a location other than the magnetic gap.

In turn, in the case of distribution figure with  $Y = 0.2 \mu\text{m}$ , there is no area where the magnetic field distribution is concentrated as indicated in the Sketch 2B and it is apparent that the magnetic field distributions are concentrated at the magnetic field gap.

[Sketch I]

Sketch 1 shows a result of calculation of a distance  $Y$  of the upper magnetic core and a maximum magnetic field  $H_{\text{max}}$  at a floating plane. This is standardized at a maximum magnetic field with  $Y = 0 \mu\text{m}$ .

[Sketches 2A and 2B]

In Sketches 2A and 2B is indicated a magnetic field distribution on the floating plane (only the right side of the track). There are two types of magnetic field distribution with  $Y = 0 \mu\text{m}$  (Sketches 2A) and  $Y > 0 \mu\text{m}$  (data is  $0.2 \mu\text{m}$ ) (Sketches 2B).

As apparent from Sketch 1, as the value of  $Y$  is increased, the value of  $H_{\max}$  is decreased. In particular, reduction in  $H_{\max}$  with  $Y > 1.5\mu\text{m}$  or more becomes remarkable. In view of this fact, it is possible to say that a value of  $Y = 1.5\mu\text{m}$  or less is preferable. Then, in the case of  $Y = 0\mu\text{m}$ , the value of  $H_{\max}$  becomes the largest value. However, as apparent from the magnetic field distribution with  $Y = 0\mu\text{m}$  shown in Sketch 2A, it is apparent that a magnetic field concentrated portion is present at the end part of the rear segment in the upper magnetic core. That is, there is a possibility that a recording is conducted at a portion other than a track portion. In order to prevent this phenomenon, it is effective to isolate the rear portion of the upper magnetic core from the floating plane, i.e. it is set to have a relation of  $Y > 0\mu\text{m}$ . In Sketch 2B is indicated a magnetic field distribution with  $Y = 0.2\mu\text{m}$ . As compared with the case of  $Y = 0\mu\text{m}$ , the magnetic field concentration can be remarkably reduced.

In reference to the foregoing description, it is possible to say that the distance  $Y$  between the floating plane and the step part of the double-staged upper magnetic core is  $0.2\mu\text{m}$  to  $1.5\mu\text{m}$ .